



# National Transportation Safety Board

Washington, DC 20594

## Safety Recommendation

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**Date:** July 16, 2014

**In reply refer to:** A-14-37 through -51

The Honorable Michael P. Huerta  
Administrator  
Federal Aviation Administration  
Washington, DC 20590

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On June 24, 2014, the NTSB adopted its report concerning the July 6, 2013, accident, in which a Boeing 777-200ER, Korean registration HL7742, operating as Asiana Airlines flight 214, was on approach to runway 28L when it struck a seawall at San Francisco International Airport, San Francisco, California.<sup>1</sup> Additional information about this accident and the resulting recommendations may be found in the report of the investigation, which can be accessed at our website, <http://www.nts.gov>, under report number AAR-14/01.

As a result of this investigation, the NTSB issued 27 new recommendations, including 4 to Asiana Airlines, 2 to Boeing, 4 to the Aircraft Rescue and Firefighting Working Group, 2 to the City and County of San Francisco, and the following 15 recommendations to the Federal Aviation Administration:

### A-14-37

Require Boeing to develop enhanced 777 training that will improve flight crew understanding of autothrottle modes and automatic activation system logic through improved documentation, courseware, and instructor training.

### A-14-38

Once the enhanced Boeing 777 training has been developed, as requested in Safety Recommendation A-14-37, require operators and training providers to provide this training to 777 pilots.

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<sup>1</sup> National Transportation Safety Board. *Descent Below Visual Glidepath and Impact With Seawall, Asiana Airlines Flight 214, Boeing 777-200ER, HL7742, San Francisco, California, July 6, 2013*. AAR-14/01 (Washington, DC: National Transportation Safety Board, 2014).

A-14-39

Require Boeing to revise its 777 Flight Crew Training Manual stall protection demonstration to include an explanation and demonstration of the circumstances in which the autothrottle does not provide low speed protection.

A-14-40

Once the revision to the Boeing 777 Flight Crew Training Manual has been completed, as requested in Safety Recommendation A-14-39, require operators and training providers to incorporate the revised stall protection demonstration in their training.

A-14-41

Convene an expert panel (including members with expertise in human factors, training, and flight operations) to evaluate methods for training flight crews to understand the functionality of automated systems for flightpath management, identify the most effective training methods, and revise training guidance for operators in this area.

A-14-42

Convene a special certification design review of how the Boeing 777 automatic flight control system controls airspeed and use the results of that evaluation to develop guidance that will help manufacturers improve the intuitiveness of existing and future interfaces between flight crews and autoflight systems.

A-14-43

Task a panel of human factors, aviation operations, and aircraft design specialists, such as the Avionics Systems Harmonization Working Group, to develop design requirements for context-dependent low energy alerting systems for airplanes engaged in commercial operations.

A-14-44

Conduct research that examines the injury potential to occupants in accidents with significant lateral forces, and if the research deems it necessary, implement regulations to mitigate the hazards identified.

A-14-45

Conduct research to identify the mechanism that produces high thoracic spinal injuries in commercial aviation accidents, and if the research deems it necessary, implement regulations to mitigate the hazards identified.

A-14-46

Analyze, in conjunction with slide/raft manufacturers, the information obtained in this accident investigation and evaluate the adequacy of slide and slide/raft certification standards and test methods specified in Federal Aviation Administration regulations and guidance materials. If appropriate, modify certification standards and test methods for future slide and slide/raft design based on the results of this evaluation.

A-14-47

Work with the Aircraft Rescue and Firefighting Working Group and equipment manufacturers to develop and distribute more specific policies and guidance about when, how, and where to use the high-reach extendable turret's unique capabilities.

A-14-48

Once the minimum staffing level has been developed by the Aircraft Rescue and Firefighting (ARFF) Working Group, as requested in Safety Recommendation A-14-60, amend 14 *Code of Federal Regulations* 139.319(j) to require a minimum ARFF staffing level that would allow exterior firefighting and rapid entry into an airplane to perform interior firefighting and rescue of passengers and crewmembers.

A-14-49

Work with the Aircraft Rescue and Firefighting (ARFF) Working Group to develop and distribute policy guidance and training materials to ensure that all airport and mutual aid firefighting officers placed in command at the scene of an aircraft accident have at least a minimum level of ARFF training.

A-14-50

Issue a CertAlert to all Part 139 airports to distribute the information contained in the Federal Aviation Administration's (FAA) legal interpretation of 14 *Code of Federal Regulations* 139.319 that requires all personnel assigned to aircraft rescue and firefighting duties to meet the initial and recurrent training and live-fire drill requirements and clarify how the FAA will enforce this regulation.

A-14-51

Conduct a special inspection of San Francisco International Airport's emergency procedures manual and work closely with the airport to ensure that the airport meets its obligations under Part 139.325.

These safety recommendations are derived from the NTSB's investigation and are consistent with the evidence we found and the analysis we performed. Acting Chairman HART and Members SUMWALT, ROSEKIND, and WEENER concurred in these recommendations.

The NTSB is vitally interested in these recommendations because they are designed to prevent accidents and save lives. We would appreciate receiving a response from you within 90 days detailing the actions you have taken or intend to take to implement them. When replying, please refer to the safety recommendations by number. We encourage you to submit your response electronically to [correspondence@ntsb.gov](mailto:correspondence@ntsb.gov).

[Original Signed]

By: Christopher A. Hart,  
Acting Chairman